Chapter 5
Environmental Basis of Comparison – NCCP Community Descriptions

5.1 Introduction to NCCP Community Descriptions

The following descriptions of NCCP communities are taken directly from the MSCS. Proposed Ecosystem Restoration Program goals (CALFED NCCP Community goals) for each community type are included with the descriptions. Each habitat description also includes a discussion on the relationship between EWA and the NCCP community goal. This discussion describes effects of EWA asset acquisition and management actions on each habitat. A detailed environmental consequences analysis can be found in Chapter 6.

The MSCS identifies 18 terrestrial habitat types, also termed NCCP habitats, and two fish communities based on commonly recognized features. A review of the EWA Proposed Action and associated conservation measures that 13 of the 18 NCCP habitats to be potentially affected by an EWA action. The Grassland, Upland Scrub, Valley/Foothill Woodland and Forest, Montane Woodland and Forest, and Inland Dune Scrub NCCP habitats will not be affected by EWA actions and are not addressed in this ASIP (See Chapter 1, Section 1.5)

A total of 20 natural communities were analyzed on a broad, programmatic basis in the MSCS – 18 habitats and two ecologically based fish groups. The term "NCCP communities" refers to both habitats and fish groups. The MSCS assigned a conservation goal to each NCCP community. The goals for the NCCP communities were developed within the ERP and the Strategic Plan for Ecosystem Restoration. Goals for NCCP habitats not addressed by the ERP were predicated on the fisheries and aquatic ecosystems and vegetation and wildlife strategies in the CALFED Programmatic EIS/EIR.

Table 5-1 provides a crosswalk of the NCCP habitat types included in this ASIP to other commonly used community and habitat classification systems. The ability to translate NCCP habitat type designations into other designations is necessary to provide a common understanding among ASIP users of what communities are encompassed in each NCCP habitat. The crosswalk provides the basis for using existing community and habitat distribution maps and geographic information systems (GISs) of the action area to analyze effects of the Proposed Action in development of this ASIP. The text that follows presents a description of the NCCP communities addressed in this ASIP and their relationship within the EWA Action Area.

Table 5-1 Crosswalk of MSCS NCCP Habitat Types to Other Community and Habitat Classification Systems					
MSCS NCCP Habitat Type	**Equivalent Community or Habitat Type Under Other Classification Systems**				
	Ecosystem Restoration Program	**Wildlife Habitat Relationships [(a)]**	**Terrestrial Natural Communities of California [(b)]**	**National Wetland Inventory [(c)]**	**Department of Water Resources [(d)]**
Tidal perennial aquatic	Tidal perennial aquatic, Delta sloughs, and midchannel islands and shoals	Estuarine	None	Estuarine (aquatic subtypes only)	Water surface
Valley riverine aquatic	Riparian and riverine aquatic	Riverine	None	Riverine (aquatic subtypes only)	Water surface
Montane riverine aquatic	Riparian and riverine aquatic	Riverine	None	Riverine (aquatic subtypes only)	Water surface
Lacustrine	Nontidal perennial aquatic	Lacustrine	None	Lacustrine (aquatic subtypes only)	Water surface
Saline emergent	Saline emergent wetland	Saline emergent wetland	Coastal saltmarsh (52100) and coastal brackish marsh (52200)	Estuarine/emergent	Riparian vegetation: marshlands
Tidal freshwater emergent	Fresh emergent wetland, Delta sloughs, and midchannel islands and shoals	Fresh emergent wetland	Coastal and valley freshwater marsh (52410)	Palustrine/emergent/tidal	Riparian vegetation: marshlands
Nontidal freshwater permanent emergent	Fresh emergent wetland	Fresh emergent wetland and wet meadow	Freshwater marsh (52400), alkali marsh (52300), and meadow and seep (45000)	Palustrine/emergent/nontidal/ permanent; lacustrine/emergent/permanent; riverine/emergent/permanent	Riparian vegetation: marshlands; riparian vegetation: natural high-water table
Natural seasonal wetland	Seasonal wetlands	Fresh emergent wetland	Vernal pool (44000), vernal marsh (52500) and alkali playa (46000)	Palustrine/emergent/nontidal/ seasonal	None
Managed seasonal wetland	Seasonal wetlands	Fresh emergent wetland	Vernal marsh (52500)	Palustrine/emergent/nontidal/ seasonal/artificial	Riparian vegetation: duck marsh
Valley/foothill riparian	Riparian and riverine aquatic	Valley foothill riparian	Great Valley riparian forest (61400), sycamore alluvial woodland (62100) and Great Valley riparian scrub (63400)	Estuarine/scrub-shrub, estuarine/ forested, palustrine/scrub-shrub, and palustrine/forested	Riparian vegetation: trees and shrubs.
Montane riparian	Riparian and riverine aquatic	Montane riparian	Montane riparian forest (61500) and montane riparian scrub (63500)	Estuarine/scrub-shrub, estuarine/ forested, palustrine/scrub-shrub, and palustrine/forested	Riparian vegetation: trees and shrubs.
Grassland	Perennial grassland	Annual grassland and perennial grassland	Valley and foothill grassland (42000)	Upland	Native vegetation: grassland
Inland dune scrub	Inland dune scrub	None	Stabilized interior dunes (23100)	Upland	None

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Upland scrub	None	Montane chaparral, mixed chaparral, chamise-redshank chaparral, and alkali desert scrub	Great valley chenopod scrub (36200), chaparral (37000), and Diablan sage scrub (32600)	Upland	Native vegetation: light brush, medium brush, and heavy brush
Valley/foothill woodland and forest	None	Valley oak woodland, blue oak woodland, and blue oak-foothill pine	Cismontane woodland (71000), interior live oak forest (81330)	Upland	Native vegetation: brush and timber
Montane woodland and forest	None	Sierran mixed conifer, Douglas-fir, ponderosa pine, aspen, montane hardwood conifer, and montane hardwood	Broadleaved upland forest (81000), upland Douglas fir forest (82420), and Sierran coniferous forest (84200)	Upland	None
Upland cropland	Agricultural lands	Cropland, pasture, and orchard-vineyard	None	Upland	Grain and hay crops, field crops, truck and berry crops, pasture, and idle
Seasonally flooded agriculture	Agricultural lands	Cropland	None	Palustrine/framed	Grain and hay crops, field crops, and rice

Notes: In many cases, the MSCS NCCP habitats do not directly crosswalk to other classifications. NCCP habitats may encompass several habitats from other classifications or only a portion of a habitat from another classification. Habitats from other classifications may encompass several NCCP habitats.

(a) Mayer, K.E. and W.F. Laundenslayer (eds). 1988. A guide to wildlife habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA.

(b) Holland, R.F. 1986. Preliminary description of the terrestrial communities of California. California Department of Fish and Game. Sacramento, CA. Numbers in parentheses are Natural Diversity Database element codes corresponding to each community type.

(c) Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. Washington, D.C.

(d) California Department of Water Resources. 1993. Land cover mapping program. Sacramento, CA.

5.2 Tidal Perennial Aquatic

Description: Tidal perennial aquatic (TPA) habitat is defined as deepwater aquatic (greater than 3 meters deep from mean low tide), shallow aquatic (less than or equal to 3 meters deep from mean low tide), and unvegetated intertidal (i.e., tideflats) zones of estuarine bays, river channels, and sloughs (MSCS 2000).

Historical and Current Distribution and Status: There has been substantial loss of historic shallow tidal waters, mainly as a result of reclamation and channel dredging and scouring. Many animal and plant species, identified as threatened or endangered under the California and federal endangered species acts (ESAs), rely on tidal perennial aquatic habitat during some portion of their life cycle. Many leveed lands in the Bay and Delta have subsided and are too low to support shallow tidal perennial aquatic habitat. The greatest subsidence has occurred in the Central and West Delta Ecological Management Unit. All major habitat types in the Delta, Suisun Bay, Suisun Marsh, and San Francisco Bay have been reduced to a small fraction of the area they once occupied, resulting in a large number of at-risk plant and animal species and an increased susceptibility of the remaining areas to irreversible degradation (e.g., invasion by non-native species) (ERPP 2000, pages 114 – 116).

The functions of the Delta sloughs have been degraded severely over the years. Urban and industrial development has moved into areas adjacent to sloughs, destroying historic riparian habitat. Invasion and spread of non-native plant species, such as water hyacinth, reduced water quality, and reduced freshwater outflows have also historically contributed to degradation. Existing natural sloughs require protection and habitat improvement (ERPP 2000, page 125).

Midchannel islands and shoals have been shrinking or disappearing from progressive erosion of the remaining habitat. Major factors contributing to the loss of midchannel islands and shoals are gradual erosion from channels conveying water across the Delta to South Delta pumping plants, boat wakes, and dredging within the Delta or on adjacent waters. The Delta formerly supported broad expanses of tule marshes, riparian forests, and shallow-water habitats. Today, intensive agricultural production on levee-bounded islands has replaced most of these habitats (ERPP 2000, page 128).

Relationship to EWA Action Area: Tidal perennial aquatic habitat can be found in the Delta and Suisun Bay.

CALFED NCCP Community Goal: The CALFED NCCP community goal is to restore 9,000 acres of tidal perennial aquatic habitat and approximately 150–330 miles (900–1,700 acres) of tidal sloughs within CALFED's Delta and Bay Regions. Additionally the goal is to avoid, minimize, and compensate for all CALFED effects on tidal perennial aquatic habitat.

5.3 Valley Riverine Aquatic

Description: Valley riverine aquatic (VRA) habitat includes the water column of flowing streams and rivers in low-gradient channel reaches below an elevation of

approximately 300 feet that are not tidally influenced. Additionally, VRA includes associated shaded riverine aquatic (SRA), pool, riffle, run, and unvegetated channel substrate (including seasonally exposed channel bed) habitat features, and sloughs, backwaters, overflow channels, and flood bypasses hydrologically connected to stream and river channels (MSCS 2000). The dominant vegetation of valley riverine aquatic habitat includes plankton, water moss, algae, and duckweed. Aquatic species include riffle insects such as the nymphs of caddisflies, mayflies, alferflies, and stoneflies; pool insects such as dragonflies, damselflies, and water striders; and mollusks, crustaceans, diving beetles, water boatmen. Avian species associated with VRA habitat include waterfowl, wading birds, shorebirds, and raptors such as gulls, terns, osprey, bald eagles, herons, kingfisher, swallows, swifts, and flycatchers. Mammal species associated with VRA include river otter, muskrat, and beaver.

Historical and Current Distribution and Status: Historically, the Central Valley floor had approximately 922,000 acres of riparian vegetation supported by a watershed of more than 40,000 square miles. Today, approximately 100,000 acres of riparian forest remain. About half of this riparian habitat is in a highly degraded condition, representing a decline of 90 percent. The Sacramento River once supported 500,000 acres of riparian forest; it now supports 10,000 - 15,000 acres, or just 2 - 3 percent of historic levels. From about 1850 to the turn of the century, most of the forest was destroyed for fuel as a result of the Gold Rush and river navigation, and by large-scale agricultural clearing (ERPP 2000, page 152).

Additional clearing in early and mid 1900s coincided with the aftermath of flood control reservoir and levee projects. These projects allowed ongoing clearing of floodplain riparian stands for orchards, crops, flood bypasses, levee construction, and urban areas. Similar patterns occurred along the San Joaquin River, which was also greatly affected when major portions of the river were dried up following construction of Friant Dam and other large reservoirs in the San Joaquin Basin. Resulting major changes in river flow conditions and sediment deposits triggered channel instability, and downcutting of rivers and streams that caused additional riparian and riverine habitat loss and fragmentation (ERPP 2000, page 152).

The condition of riverine aquatic and nearshore habitats is not well documented for most of Central Valley and Delta estuaries, rivers, and streams. The condition of these habitats has been degraded by channel straightening; channel incising; channel dredging and clearing; instream gravel mining; riparian zone grazing; flow modifications; removal and fragmentation of shoreline riparian vegetation; and the loss of sediment, bedload, and woody debris from watershed sources upstream of dams (ERPP 2000, page 152).

Relationship to EWA Action Area: This habitat occurs below 300 ft amsl for all areas described in this section. Valley Riverine Aquatic habitat on the Sacramento River extends from approximately the legal limits of the Delta (Sacramento River at the I Street bridge) to the vicinity of Red Bluff, California. VRA habitat on the Feather River extends from the juncture of the Sacramento and Feather Rivers up to Oroville.

VRA habitat on the Yuba River extends from the juncture of the Sacramento and Yuba Rivers up to approximately Timbuctoo Bend. VRA habitat on the American River extends from the juncture of the Sacramento and American Rivers to Folsom Lake. VRA habitat on the Merced River extends from the juncture of the Merced and San Joaquin Rivers to Merced Falls. VRA habitat on the San Joaquin River in the EWA Action Area extends from the juncture of the Merced and San Joaquin Rivers to the Delta. Delta waterways that are classified as VRA include the Sacramento, San Joaquin, Consumnes, Mokelumne, and Calaveras rivers and other sloughs, streams, and ephemeral creeks. Major waterways with VRA in Suisun Bay and Marsh area include Suisun, Montezuma, and Nurse sloughs.

CALFED NCCP Community Goal: The CALFED NCCP goal is to 1) substantially increase SRA instream habitats; 2) improve flows for anadromous and other native fishes; 3) improve stream temperatures; and 4) improve anadromous fish passage and rearing along the Sacramento and San Joaquin Rivers and their tributaries. Additionally the goal is to avoid, minimize, and compensate for all CALFED effects on valley riverine aquatic habitat. CALFED will reach its goals for valley riverine and montane riverine aquatic habitats by restoring approximately 10,550–11,800 acres of riparian habitat along 235 miles of channels, and by protecting and enhancing approximately 18,000–26,000 acres of stream channel meander corridors. Some riverine aquatic habitat will be restored and enhanced on montane streams, but most will occur on valley streams.

5.4 Montane Riverine Aquatic

Description: Montane riverine aquatic (MRA) habitat includes the water column of flowing streams and rivers above an elevation of approximately 300 feet. Additionally, MRA includes associated SRA, pool, riffle, run, and unvegetated channel substrate (including seasonally exposed channel bed) habitat features, and sloughs, backwaters, and overflow channels hydrologically connected to stream and river channels (MSCS 2000). The vegetation and wildlife associated with montane riverine aquatic habitat is similar to valley riverine aquatic habitat species.

Historical and Current Distribution and Status: Montane riverine habitats are found statewide usually between 300 and 8,000 feet. Mountain ranges with montane riverine habitat include the Klamath, Coast, Cascade, Sierra Nevada, Penninsular, and Transverse.

Relationship to EWA Action Area: This habitat occurs above 300ft amsl for all areas described in this section. MRA habitat on the Sacramento River extends from Red Bluff, CA to Lake Shasta. MRA habitat on the Feather River extends between Oroville, CA and Lake Oroville, and then continues from Lake Oroville to Little Grass Valley Reservoir. MRA habitat can also be found along Lost Creek from its juncture with the Feather River to Sly Creek Reservoir. MRA habitat on the Yuba River in the EWA Action Area extends from approximately Timbuctoo Bend to New Bullards Bar Reservoir. MRA habitat on the American River in the EWA Action Area extends from approximately Folsom Lake to French Meadows Reservoir. MRA habitat on the

Merced River in the EWA Action Area extends from Merced Falls, CA through Lake McSwain to Lake McClure.

CALFED NCCP Community Goal: As with VRA, the goal is to 1) increase the extent of SRA and instream habitats; 2) improve flows for anadromous and other native fishes; 3) improve stream temperatures; and 4) improve anadromous fish passage and rearing along tributaries of the Sacramento and San Joaquin Rivers and the North Bay. Additionally the goal is to avoid, minimize, and compensate for all CALFED effects on MRA habitat. CALFED will reach its goals for montane riverine and valley riverine aquatic habitat by restoring approximately 10,550–11,800 acres of riparian habitat along 235 miles of channels, and protecting and enhancing approximately 18,000–26,000 acres of stream channel meander corridors. Some riverine aquatic habitat will be restored and enhanced on montane streams, but most will occur on valley streams.

5.5 Lacustrine

Description: Lacustrine habitat is defined as portions of permanent bodies of water that do not support emergent vegetation and that are not subject to tidal exchange, including lakes, ponds, oxbows, gravel pits, and flooded islands (MSCS 2000). Plankton, water willies, duckweed, pondweed, and smartweeds are the dominant vegetation for openwater lacustrine habitats. When water levels are low, exposed shorelines (drawdown zones) are a common feature of lacustrine habitats, and include rocky, sandy, or silty substrates. Aside from ruderal species, these areas are usually devoid of vegetation because of the inundation/desiccation cycle associated with fluctuating reservoir water levels. Lacustrine habitats are used by a wide variety of birds, mammals, reptiles, and amphibians for reproduction, food, water, and cover.

Historical and Current Distribution and Status: Nontidal perennial aquatic habitat in the Bay-Delta estuary is present in certain low-elevation areas. Historically, most wetlands in the Bay-Delta estuary were tidal. Nontidal perennial aquatic habitats were largely nonexistent. Some historical nontidal perennial habitat was created naturally. Shifts in river alignments occasionally isolated oxbow lakes, and drainage divide ponds in Bay area tidal wetlands were subjected to limited tidal action. Most of the remaining nontidal perennial aquatic habitat areas were established by constructing dikes and levees. Isolating these areas allowed their conversion for other uses, primarily agricultural. Perennial aquatic habitats on converted lands are primarily located in large agricultural drains, small farm ponds, industrial ponds, ponds managed for waterfowl and other wildlife, and Delta island blowout ponds (created by levee failures that scour island interiors deeply enough to maintain permanent water through seepage) (ERPP 2000, page 119).

Existing nontidal open-water areas generally have poor wildlife value. Nontidal perennial aquatic habitats have insufficient shoreline cover for nesting and protection from predators. Adjacent lands are relatively barren (e.g., farmed fields and land next to industrial ponds) and lack cover needed by nesting waterfowl and other species that require adjacent open-water and upland habitats. A notable exception is the

unreclaimed blowout ponds, around which native vegetation has been allowed to establish (e.g., ponds on Webb Tract) (ERPP 2000, page 119).

All major habitat types in the Delta, Suisun Bay, Suisun Marsh, and San Francisco Bay have been reduced to a small fraction of the area they once occupied, resulting in a large number of at-risk plant and animal species and an increased susceptibility of the remaining areas to irreversible degradation (e.g., invasion by non-native species) (ERPP 2000, page 116).

The major lacustrine habitats associated with the EWA Action Area are the man-made water storage reservoirs. These are water bodies within rivers that are controlled by dam structures. Seasonal operations of the reservoirs for water supply storage/release and power production cause wide variations in surface water elevation and nonvegetated shoreline vegetation. In the Export Service Area there are a number of off-stream reservoirs with primary purpose of water supply storage and release for agriculture and municipal uses.

Relationship to the EWA Action Area: Lacustrine habitat along the Sacramento River includes Lake Shasta and Keswick Reservoir. In addition, historical meandering by the Sacramento River has created remnant oxbow and floodplain lakes within the Action Area. Lacustrine habitat along the Feather River includes Little Grass Valley and Sly Creek Reservoirs, Lake Oroville, and the Thermalito Afterbay. Lacustrine habitat along the Yuba River includes New Bullards Bar Reservoir and Englebright Lake. Lacustrine habitat along the American River begins with French Meadows and Hell Hole Reservoirs and includes Folsom Lake and Lake Natoma. Lacustrine habitat along the Merced and San Joaquin Rivers within the Action Area includes Lakes McClure and McSwain. Lacustrine habitats such as dead end sloughs, forebays, and flooded islands can be found in the Delta. Lacustrine habitat within the Export Service Area includes San Luis Reservoir, Anderson Reservoir, Castaic Lake, Silverwood Lake, Lake Perris, Lake Mathews, and Diamond Valley Lake.

CALFED NCCP Community Goal: The goal is to restore 1,600 acres of lacustrine habitat adjacent to existing and restored wetlands in the CALFED Bay Region. Additionally the goal is to avoid, minimize, and compensate for loss of lacustrine habitat where evaluated species are affected by CALFED actions.

5.6 Saline Emergent

Description: Saline emergent (SE) habitat includes the portions of Suisun Bays and the Delta that support emergent wetland plant species that are tolerant of saline or brackish conditions within the intertidal zone or on lands that historically were subject to tidal exchange (i.e., diked wetlands) (MSCS 2000). The dominant vegetation for saline emergent habitats include cordgrass, pickleweed, and bulrush, glasswort, saltwort, saltgrass, arrowgrass, seablite, hairgrass, cattail, and algae. Remnants of developed saline emergent habitats are present along the shores of Suisun Bay and in

the western Delta. Some wildlife species that use saline emergent habitats include ducks, herons, egrets, and hawks.

Historical and Current Distribution and Status: Saline emergent wetlands were once continuous from San Francisco Bay into the western Delta. Saline emergent habitat also is found in low-elevation areas of the Central Valley where salts have accumulated and groundwater is near the surface. Most remnant tidal saline emergent wetlands are narrow bands along the margins of San Pablo Bay and Suisun Marsh and Bay. Extensive relict tidal marshes are associated with Cutoff Slough and eastern Hill Slough flank the Potrero Hills in the north-central Suisun Marsh and are especially unique in that there is a wetland continuum from tidal sloughs through low, middle, and high marsh zones and into adjacent uplands which are rich with associated vernal pools (ERPP 2000, page 133).

Land use changes over the past century have reduced the amount of saline emergent wetland habitat and fragmented what was once nearly contiguous habitat. In particular, diking of historic wetlands has substantially reduced the amount of tidally influenced saline emergent wetlands. Large areas of nontidal wetlands that were created largely by diking for reclamation are present in the Suisun Marsh and Bay areas (ERPP 2000, page 133).

Water management in California's Central Valley reduced saltwater flowing into the Delta. Before the development of California's water storage/conveyance systems, saltwater intruded far into the upper Delta during summer months. This saltwater intrusion created a seasonally wide range of salinity over a large portion of the estuary. Reservoir operations and other water management practices have reduced saltwater intrusion into the Delta by retaining water during winter and releasing water during summer. Consequently, the area that can support brackish wetlands has been reduced, and the area that can support fresh emergent wetlands has increased. Complex water control systems are now required in Suisun Marsh to preserve the largest single area of saline emergent wetland habitat in California (ERPP 2000, page 133).

Since the turn of the century, an estimated 70,000 acres of saline emergent wetland have been lost in the Suisun Marsh and Bay and the west Delta. The primary factor causing this loss has been wetland conversion to agricultural and other land uses (ERPP 2000, page 134).

Relationship to the EWA Action Area: Saline emergent habitat can be found in Suisun Bay and western portions of the Delta, often as narrow bands along the margins of waterways.

CALFED NCCP Community Goal: The goal is to restore 7,500–12,000 acres and enhance 6,200 acres of saline emergent habitat, and restore habitat along 35–70 miles (215–425 acres) of restored tidal sloughs in the CALFED Bay Region. Additionally the goal is to avoid, minimize, and compensate for all CALFED effects on saline emergent habitat.

5.7 Tidal Freshwater Emergent

Description: Tidal freshwater emergent habitat includes portions of the intertidal zones of the Delta that support emergent wetland plant species that are not tolerant of saline or brackish conditions (MSCS 2000). The dominant vegetation for tidal freshwater emergent habitat includes California, river, and big bulrush, tules, cattails, and common reed. Freshwater emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians (Kramer 2003).

Historical and Current Distribution and Status: Over the past 150 years, more than 300,000 acres of fresh emergent wetlands have been lost in the Sacramento-San Joaquin Delta Ecological Management Zone. Less than 15,000 acres remain (ERPP 2000, page 140).

Prior to the mid-1800s, extensive areas of fresh emergent habitat occurred throughout the Central Valley, particularly in the Delta. A complex network of rivers, sloughs, and channels connected low islands and basins that supported a diverse and dense variety of freshwater emergent vegetation. This freshwater emergent vegetation supported a diversity of fish and wildlife species and ecological functions (ERPP 2000, page 140).

Vast areas of the Sacramento-San Joaquin Valley were commonly flooded in winter by a slow-moving blanket of silt-laden water. Flood control activities and land settlements in the late 1800s and early 1900s led to the development of leveed Delta islands. Levees and other land uses led to the loss of fresh emergent wetlands in the Delta. Loss of wetlands has substantially reduced habitat for wetland wildlife species in the Bay-Delta system. Fresh emergent wetland losses have also substantially reduced the area available for the biological conversion of nutrients in the Delta. The Delta contains insufficient wetland area to provide adequate levels of nutrient transformation, which results in lower quality water in San Francisco Bay (ERPP 2000, page 140).

Central Valley wetlands have experienced over a 95 percent reduction from historic extent. Isolating wetlands from tidal flows and removing Delta island fresh emergent wetlands changed the ecological processes that support wetlands. Loss of these tidal flow to islands has reduced habitat for native species of fish, plants, and wildlife; reduced water quality; and decreased the area available for floodwater dispersion and suspended silt deposition (ERPP 2000, page 141).

High water velocities in confined Delta channels continue to erode remaining fresh emergent wetland at a greater rate than habitat formation. Continued erosion reduces the amount of fresh emergent habitat and changes the elevation of the land. Elevation affects the types of plant species that can grow depending on a species' ability to tolerate flooding. Flood protection and levee maintenance continue to impair wetland vegetation and prevent the natural reestablishment of fresh emergent wetlands in some locations (ERPP 2000, page 141).

Wind, boat-wake waves, and high water velocities in confined channels actively erode the soil needed to support remnant fresh emergent wetlands. Continued erosion of existing habitat, such as midchannel islands and levees and levee berms, is currently the primary cause of habitat loss in the Delta (ERPP 2000, page 141).

The functions of the Delta sloughs have been degraded severely over the years. Urban and industrial development has moved into areas adjacent to sloughs, destroying historic riparian habitat. Invasion and spread of non-native plant species, such as water hyacinth, reduced water quality, and reduced freshwater outflows have also historically contributed to degradation. Existing natural sloughs require protection and habitat improvement (ERPP 2000, page 125).

Midchannel islands and shoals have been shrinking or disappearing from progressive erosion of the remaining habitat. Major factors contributing to the loss of midchannel islands and shoals are gradual erosion from channels conveying water across the Delta to South Delta pumping plants, boat wakes, and dredging within the Delta or on adjacent waters. The Delta formerly supported broad expanses of tule marshes, riparian forests, and shallow-water habitats. Today, intensive agricultural production on levee-bounded islands has replaced most of these habitats (ERPP 2000, page 128).

Relationship to the EWA Action Area: Tidal freshwater emergent habitat occurs in the Delta along island levees, channel islands, and shorelines (ERPP 2000).

CALFED NCCP Community Goal: The goal is to increase the extent of tidal freshwater emergent habitat by 30,200–45,800 acres in the CALFED Delta Region through restoration, restore habitat along 115–260 miles (700–1,275 acres) of restored tidal sloughs, and enhance habitat by controlling non-native plants. Additionally the goal is to avoid, minimize, and compensate for all CALFED effects on tidal freshwater emergent habitat.

5.8 Nontidal Freshwater Permanent Emergent

Description: Nontidal freshwater permanent emergent (NFPE) includes permanent (natural and managed) wetlands, including meadows, dominated by wetland plant species that are not tolerant of saline or brackish conditions (MSCS 2000). Vegetation and wildlife for nontidal freshwater permanent emergent habitats are essentially the same as for tidal freshwater emergent habitats.

Historical and Current Distribution and Status: Over the past 150 years, more than 300,000 acres of fresh emergent wetlands have been lost in the Sacramento-San Joaquin Delta Ecological Management Zone. Less than 15,000 acres remain (ERPP 2000, page 140).

Prior to the mid-1800s, extensive areas of fresh emergent habitat occurred throughout the Central Valley, particularly in the Delta. A complex network of rivers, sloughs, and channels connected low islands and basins that supported a diverse and dense

variety of freshwater emergent vegetation. This freshwater emergent vegetation supported a diversity of fish and wildlife species and ecological functions (ERPP 2000, page 140).

Vast areas of the Sacramento-San Joaquin Valley were commonly flooded in winter by a slow-moving blanket of silt-laden water. Flood control activities and land settlements in the late 1800s and early 1900s led to the development of leveed Delta islands. Levees and other land uses led to the loss of fresh emergent wetlands in the Delta. Loss of wetlands has substantially reduced habitat for wetland wildlife species in the Bay-Delta system. Fresh emergent wetland losses have also substantially reduced the area available for the biological conversion of nutrients in the Delta. The Delta contains insufficient wetland area to provide adequate levels of nutrient transformation, which results in lower quality water in San Francisco Bay (ERPP 2000, page 140).

Central Valley wetlands have experienced over a 95 percent reduction from historic extent. Isolating wetlands from tidal flows and removing Delta island fresh emergent wetlands changed the ecological processes that support wetlands. Loss of these tidal flow to islands has reduced habitat for native species of fish, plants, and wildlife; reduced water quality; and decreased the area available for floodwater dispersion and suspended silt deposition (ERPP 2000, page 141).

High water velocities in confined Delta channels continue to erode remaining fresh emergent wetland at a greater rate than habitat formation. Continued erosion reduces the amount of fresh emergent habitat changes the elevation of the land. Elevation affects the types of plant species that can grow depending on a species' ability to tolerate flooding. Flood protection and levee maintenance continue to impair wetland vegetation and prevent the natural reestablishment of fresh emergent wetlands in some locations (ERPP 2000, page 141).

Wind, boat-wake waves, and high water velocities in confined channels actively erode the soil needed to support remnant fresh emergent wetlands. Continued erosion of existing habitat, such as midchannel islands and levees and levee berms, is currently the primary cause of habitat loss in the Delta (ERPP 2000, p. 141).

Relationship to the EWA Action Area: NFPE habitat occurs throughout the Delta in areas where soils are inundated or saturated for all or most of the growing season, such as landward sides of levees, constructed waterways, and ponds. NFPE also occurs on Delta islands in low-lying areas among crop and pasture land.

CALFED NCCP Community Goal: The goal is to restore 19,600 acres of nontidal freshwater permanent emergent habitat in the CALFED Delta Region, including 2,600 acres of open-water areas within restored wetlands. Avoid, minimize, and compensate for all CALFED effects on nontidal freshwater permanent emergent habitat.

5.9 Natural Seasonal Wetland

Description: Natural seasonal wetland habitat includes vernal pools and other nonmanaged seasonal wetlands with natural hydrologic conditions that are dominated by herbaceous vegetation and that annually pond surface water or maintain saturated soils at the ground surface for enough of the year to support facultative or obligate wetland plant species. Alkaline and saline seasonal wetlands that were not historically part of a tidal regime are included in natural seasonal wetlands (MSCS 2000). Dominant natural seasonal wetland vegetation includes big leaf sedge, bulrush, and redroot nutgrass. Examples of special-status plant species associated with natural seasonal wetland habitats include Alkali milk-vetch, Crampton's tuctoria, Colusa grass, Bogg's lake hedge-hyssop, legenere, Hoover's spurge, Butte County meadowfoam, Greene's tuctoria, slender orcutt grass, hairy orcutt grass. Examples of special-status animal species associated with natural seasonal wetland include American peregrine falcon, California gull, greater sandhill crane, long-billed curlew, northern harrier, short-eared owl, Swainson's hawk, tricolored blackbird, white-tailed kite, giant garter snake, California red-legged frog, California tiger salamander, western spadefoot toad, conservancy fairy shrimp, Delta green ground beetle, longhorn fairy shrimp, mid-valley fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

Historical and Current Distribution and Status: Historically, seasonal wetlands occurred throughout the Central Valley. The extent and quality of seasonal wetlands has declined because of cumulative effects of many factors, including:

- modification of natural geomorphology such as ground leveling for agriculture and development,
- adverse effects of overgrazing,
- contamination from herbicides,
- establishment of non-native species that have an adverse effect on native wetland plants and wildlife,
- flood control and water supply infrastructure that reduces overbank flooding and floodplain size, and
- reduction of the natural underground water table that supported wetlands (ERPP 2000, pages 146, 147).

Existing wetland regulations have been in effect for several years in an attempt to prevent the further loss of seasonal wetlands. The protected status of wetlands has resulted in an extensive permitting process for construction in wetland areas. Mitigation measures have been developed to offset loss of existing wetlands as a result of construction activities. These efforts have slowed the rate of wetland loss in many areas. Large-scale efforts in areas such as the Suisun Marsh, Grasslands

Resource Conservation District, Yolo Bypass, and Butte Sink have been successful in maintaining and restoring seasonal wetlands (ERPP 2000, page 147).

Relationship to the EWA Action Area: Natural seasonal wetland habitat may be found throughout the Sacramento and San Joaquin valleys. This includes areas where EWA actions involve groundwater substitution, groundwater purchase, and crop idling.

CALFED NCCP Community Goal: Protect, enhance, or restore 100 acres of vernal pools and 500–1,000 acres of surrounding native upland buffer habitat in the CALFED Bay Region. Avoid, minimize, and compensate for all CALFED effects on natural seasonal wetland habitat.

5.10 Managed Seasonal Wetland

Description: Managed seasonal wetland habitat includes wetlands dominated by native or non-native herbaceous plants, excluding croplands farmed for profit (e.g., rice), that land managers flood and drain during specific periods to enhance habitat values for specific wildlife species. Ditches and drains associated with managed seasonal wetlands are included in this habitat type (MSCS 2000). Vegetation and wildlife species associated with managed seasonal wetland habitats are similar to those associated with natural seasonal wetland habitats, with the exception of vernal pool species.

Historical and Current Distribution and Status: Historically, managed seasonal wetlands did not occur in the Sacramento and San Joaquin valleys. All managed seasonal wetlands now are a result of agricultural practices and the management of water flows for wildlife (waterfowl gun clubs and wildlife refuges). The extent and quality of managed seasonal wetlands varies based on the practices that create and maintain this type of habitat.

Relationship to the EWA Action Area: Managed seasonal wetlands are either private lands managed primarily for waterfowl or state and federal wildlife areas/refuges. These wetlands occur throughout the Central Valley; however, they are concentrated in the following areas:

- along the Sacramento and its flood byways;
- along the Feather River
- in the Butte Sink;
- throughout the Delta and Suisun Marsh;
- in the Los Banos and Mendota vicinity; and
- scattered throughout the Tulare basin.

CALFED NCCP Community Goal: The goal is to restore 29,000–29,500 acres of managed seasonal wetland habitat in the CALFED Delta and Bay Regions and enhance approximately 308,125 acres of habitat in all CALFED regions. Additionally the goal is to avoid, minimize, and compensate for loss of managed seasonal wetland habitat where evaluated species are affected by CALFED actions.

5.11 Valley/Foothill Riparian

Description: Valley/foothill riparian habitat includes all successional stages of woody vegetation, within the active and historical floodplains of low-gradient reaches of streams and rivers generally below an elevation of 300 feet (MSCS 2000). Valley/Foothill Riparian habitat is dominated by a cottonwood, sycamore, alder, ash, and valley oak tree overstory and a blackberry, poison oak, and wild grape understory. In California over 225 species of birds, mammals, reptiles, and amphibians depend on riparian habitats, and cottonwood-willow riparian areas support more breeding avian species than any other comparable broad California habitat type (Merced River Corridor Restoration Plan 2002 and Sacramento River Advisory Council 2001).

Historical and Current Distribution and Status: Historically, the Central Valley floor had approximately 922,000 acres of riparian vegetation supported by a watershed of more than 40,000 square miles. Today, approximately 100,000 acres of riparian forest remain. About half of this riparian habitat is in a highly degraded condition, representing a decline of 90 percent. The Sacramento River once supported 500,000 acres of riparian forest; it now supports 10,000 - 15,000 acres, or just 2 - 3 percent of historic levels. From about 1850 to the turn of the century, most of the forest was destroyed for fuel as a result of the Gold Rush and river navigation, and by large-scale agricultural clearing (ERPP 2000, page 152).

Additional clearing in early and mid 1900s coincided with the aftermath of flood control reservoir and levee projects. These projects allowed ongoing clearing of floodplain riparian stands for orchards, crops, flood bypasses, levee construction, and urban areas. Similar patterns occurred along the San Joaquin River, which was also greatly affected when major portions of the river were dried up following construction of Friant Dam and other large reservoirs in the San Joaquin Basin. Resulting major changes in river flow conditions and sediment deposits triggered channel instability, and downcutting of rivers and streams that caused additional riparian and riverine habitat loss and fragmentation (ERPP 2000, page 152).

The condition of riverine aquatic and nearshore habitats is not well documented for most of Central Valley and Delta estuaries, rivers, and streams. The condition of these habitats has been degraded by channel straightening; channel incising; channel dredging and clearing; instream gravel mining; riparian zone grazing; flow modifications; removal and fragmentation of shoreline riparian vegetation; and the loss of sediment, bedload, and woody debris from watershed sources upstream of dams (ERPP 2000, page 152).

Relationship to EWA Action Area: Valley/foothill riparian habitat includes the approximate 0.1 to 1 mile width of woody vegetation adjacent to riverine habitats below 300 feet msl. For the EWA Action Area this habitat is scattered along: 1) the Sacramento River from approximately the legal limits of the Delta (Sacramento River at the I Street bridge) to the vicinity of Red Bluff, California; 2) the Feather River from the juncture of the Sacramento and Feather Rivers up to Oroville, CA; 3) the Yuba River from the juncture of the Sacramento and Yuba Rivers up to approximately Timbuctoo Bend; 4) the American River from the juncture of the Sacramento and American Rivers to Folsom Lake; 5) the Merced River from the juncture of the Merced and San Joaquin Rivers to Merced Falls, CA; 6) the San Joaquin River from the juncture of the Merced and San Joaquin Rivers to the Delta; and 7) Delta waterways such as the Sacramento, San Joaquin, Consumnes, Mokelumne, and Calaveras rivers and other sloughs, streams, and ephemeral creeks.

CALFED NCCP Community Goal: The goal is to: 1) restore approximately 1,200 acres of riparian habitat in the CALFED Delta Region, 200–300 acres in the CALFED Bay Region, 3,650 acres in the CALFED Sacramento River Region, and 5,450–5,950 acres in the CALFED San Joaquin River Region; 2) protect and enhance 500 acres of existing riparian habitat in the CALFED Delta Region; and 3) enhance and restore riparian habitat associated with restoration of 18,000–26,000 acres of stream channel meander corridors in the CALFED Sacramento and San Joaquin River Regions. Additionally the goal is to avoid, minimize, and compensate for all CALFED effects on valley/foothill riparian habitat.

5.12 Montane Riparian

Description: Montane riparian habitat includes all successional stages of woody vegetation, such as willow, black cottonwood, white alder, birch, and dogwood, within the active floodplains of moderate-to-high-gradient reaches of streams and rivers generally above an elevation of 300 feet (MSCS 2000). Montane Riparian habitat vegetation is dominated by cottonwood (black and Fremont [at lower altitudes]), white alder, big leaf maple, dogwood, box elder, quaking aspen, wild azalea, water birch, and buttonwillow trees. As with valley/foothill riparian habitat, numerous wildlife species depend on montane riparian habitat.

Historical and Current Distribution and Status: Montane riparian habitats are found in the Klamath, Coast, and Cascade ranges and in the Sierra Nevada south to about Kern and northern Santa Barbara usually below 8,000 feet. Montane riparian habitat also occurs in the Peninsular and Transverse ranges of southern California from about southern Santa Barbara to San Diego counties.

Relationship to EWA Action Area: Montane riparian habitat includes the approximate 0.1 to 1 mile width of woody vegetation adjacent to riverine habitats above 300 feet msl. For the EWA Action Area this habitat is scattered along: 1) the Sacramento River from Red Bluff, CA to Lake Shasta; 2) the Feather River between Oroville, CA and Lake Oroville, and then from Lake Oroville to Little Grass Valley Reservoir; 3) Lost Creek from its juncture with the Feather River to Sly Creek

Reservoir; 4) the Yuba River from approximately Timbuctoo Bend to New Bullards Bar Reservoir; 5) the American River from approximately Folsom Lake to French Meadows Reservoir; 6) the Merced River from Merced Falls, CA through Lake McSwain to Lake McClure.

CALFED NCCP Community Goal: The goal is to increase the extent and connectivity of montane riparian habitat on tributary steams in the CALFED Sacramento, San Joaquin, and Bay Regions, and to avoid, minimize, and compensate for all CALFED effects on montane riparian habitat.

5.13 Upland Cropland

Description: Upland cropland habitat includes agricultural lands farmed for grain field, truck, and other crops for profit that are not seasonally flooded (MSCS 2000). Upland cropland vegetation is dominated by cereal rye, barley, wheat, corn, dry beans, safflower, alfalfa, cotton, tomatoes, lettuce, Bermuda grass, ryegrass, tall fescue, almonds, walnuts, peaches, plums, and grapes. Wildlife use of these areas varies throughout the growing season with crop type, level of disturbance, and available cover. Orchard and vineyard typically support resident species, such as scrub jay, northern mockingbird, yeloo-billed magpie, American crow, and northern flicker. During the winter orchard habitats provide foraging habitat and roostin sites for many songbirds species including the white-crowned sparrow, dark-eyed junco, golden-crowned sparrow, lesser goldfinch, and yellow-rumped warbler. Species associated with field and row crops include the red-winged blackbird, European starling, western meadowlark, California vole, black-tailed jackrabbit, western harvest mouse, Botta's pocket gopher, raccoon, striped skunk, and Virginia opossum. Croplands provide foraging habitat for many raptors including the northern harrier, red-tailed hawk, and white-tailed kite. Cotton crops are of limited value to wildlife.

Historical and Current Distribution and Status: Prior to settlement of the valleys by Europeans, there was no agricultural practice in the valley other than the gathering of native vegetation. Following extensive native habitats loss in the Central Valley to agricultural and urban lands, some wildlife species have adapted to the artificial wetland and upland environments created by some agricultural practices. Once adapted, species became dependent on these agricultural areas to sustain their populations (ERPP 2000, page 176).

California agriculture thrives on the coasts, mountains, deserts and valleys of the Golden State. All but one of the state's 58 counties reports agricultural production (CFBF 2003).

The Central Valley contains the largest irrigated agricultural area west of the Rocky Mountains. This alluvial plain extends nearly 450 miles from the Klamath/Cascades in the north to the Tehachapis in the south and between the Coast Range and the Sierra Nevada. This region has nearly half of the state's farmland, two-thirds of the cropland and almost 75 percent of the irrigated land. A number of U.S. crops are

grown exclusively in the region, including almonds, figs, kiwifruit, nectarines, olives, persimmons, pistachios, prunes, raisins and walnuts (CFBF 2003).

The Sacramento Valley, with its cooler winters and higher rainfall, produces small grain crops and seasonal grazing on its non-irrigated acreage. Rice is the predominant irrigated crop in the areas of relatively impervious soils. Fruit and nut crops are produced on deeper, better-drained and more fertile soils. The region also has row crops such as tomatoes, beans, corn, milo and sunflowers. The foothills of the Sacramento Valley support seasonal grazing of cattle and sheep (CFBF 2003).

The southern portion of the great Central Valley - the San Joaquin Valley - is the most extensive and productive agricultural region in the state. A third of the state's farms and farmland are in this valley. Nearly half of the cropland and more than half of the irrigated acreage in California lie in this region. A variety of crops is grown in the San Joaquin Valley, including deciduous tree fruits and nuts, grapes and citrus, in addition to cotton, alfalfa and a broad spectrum of vegetable and other field crops. Dairy farming is important throughout the region. Poultry enterprises thrive on the valley floor. Beef cattle and sheep production is carried on in the foothills on irrigated pasture (CFBF 2003).

The Central Coast consists of a number of highly productive valleys lying between predominately north-south mountain ridges of the Coast Range. The region features a diverse mix of agriculture including premium winegrapes, dairies, orchard crops, strawberries and vegetables (CFBF 2003).

The state's North Coast and Mountain regions feature fewer farms in number but they tend to be larger in size per acre than other regions. The area comprises slightly more than a third of the state's total land area, but less than 1 million acres are cropped because of the topography and climate. The area is suited to timber production and livestock, such as cattle and sheep. Hay, irrigated pasture and rangeland covers privately owned land and leased public land (CFBF 2003).

The southern California region is also an important agricultural region. Farms in the region tend to be smaller in size on the average than other parts of the state, but the average value of farm products sold per acre and per farm exceeds many other regions. Crops such as avocados, citrus, vegetables and flowers grow along the South Coast in the moderate climate and breezes from the Pacific Ocean. Alfalfa, cotton, citrus, dates, small grains and winter vegetables thrive in the hotter interior valleys of Coachella and Imperial where the farms are generally larger in size compared to the coastal regions. Irrigation is critical for crop production in the interior valleys (CFBF 2003).

Agricultural lands are located throughout the Central Valley. These lands comprise many different types of agricultural land uses ranging from non-irrigated grazing land to drip-irrigated vineyard. The types of crops grown on any particular parcel are usually dictated by soil type, topography, and availability of water. Intensively managed agricultural lands or croplands are located on flat or slightly rolling terrain.

Flat cropland is usually the product of extensive surveying and laser land-leveling activities. Flat croplands provide more efficient use of water, less soil erosion, and higher crop yields. A variety of fragmented habitats that support various resident and migratory wildlife species are closely associated with these agricultural lands and includes naturally occurring wetland types (creeks, vernal pools, and gullies) (ERPP 2000, page 176).

Agricultural lands being managed for certain crops and following certain agricultural practices create wetland-like benefits for certain wildlife. These lands can provide significant habitat for some wildlife species. Crop type and cultivation practices determine the quality of habitats. Lands where wheat and corn have been harvested, particularly if they have been shallowly flooded after harvest, also support large populations of wintering waterfowl and the State-listed greater sandhill crane (ERPP 2000, page 176).

Relationship to EWA Action Area: Upland cropland habitat includes land farmed for cotton in the San Joaquin Valley.

CALFED NCCP Community Goal: The CALFED NCCP goal is to manage the upland cropland portion of 353,933–388,933 acres of agricultural lands to enhance wildlife habitat values, and to avoid, minimize, and compensate for loss of upland cropland habitat where evaluated species are affected by CALFED actions.

5.14 Seasonally Flooded Agricultural Lands

Description: Seasonally flooded agricultural land habitat includes agricultural lands farmed for grain, rice, field, truck, and other crops for profit that require seasonal flooding for at least 1 week at a time as a management practice (e.g., for pest control and irrigation) or are purposely flooded seasonally to enhance habitat values for specific wildlife species (e.g., ducks for duck clubs). Agricultural ditches and drains associated with maintaining seasonally flooded agricultural land are included in this habitat type (MSCS 2000).

Rice fields (seasonally flooded agriculture) provide important habitat for a variety of Covered Species (see Table 5-2). Many species forage on more than 350 pounds per acre of post-harvest waste grain and more than 250 pounds per acre of other food found within the fields such as duckweed, fish, and crayfish (Wrysinski, 2002 and CH2MHill, 1996). Rice can also provide resting and nesting habitat similar to natural wetlands, which is particularly important to waterfowl migrating along the Pacific Flyway (60 percent of waterbirds using the Pacific Flyway winter in the Sacramento Valley and 95 percent of historical Central Valley wetlands have been destroyed [Ducks Unlimited, Inc. 1996]). Other species dependent upon rice fields for all or part of their lifecycle include the threatened giant garter snake, various rodents feeding on waste grain, and raptors foraging for these rodents. In addition, irrigation ditches can contain wetland vegetation such as cattails, which provide habitat for rails, egrets, herons, bitterns, marsh wrens, sparrows, and common yellowthroats.

Covered Species associated with rice (Seasonally Flooded Agricultural Lands [SFA]) are provided in Table 5-2. Species associations were determined based on the 1997 report, *Special Status Wildlife Species Use of Rice Cultivation Lands in California's Central Valley* (RMI 1997), and the Draft CALFED Technical Report, *Affected Environment - Supplement to Vegetation and Wildlife* (CALFED 1998).

Historical and Current Distribution and Status: Seasonally flooded agriculture practices originated during the last century with the great expansion in the amount of flooded land for rice production during the last 50 years. For the EWA Action Area, seasonally flooded agricultural land is primarily in the Sacramento Valley.

Relationship to EWA Action Area: Seasonally flooded agricultural land includes rice lands in the Sacramento Valley, agricultural land where groundwater substitution and purchase occur, and ditches and drains that provide irrigation water to croplands and channel return flows from idled cropland. Currently the EWA Agencies are considering idling up to 55,100 acres of rice crop in 6 counties (Glenn, Colusa, Butte, Sutter, Placer, and Yolo). These counties typically harvest about 496,820 acres of rice (USDA 1997).

CALFED NCCP Community Goal: Manage the seasonally flooded agricultural land portion of 353,933–388,933 acres of agricultural lands to enhance wildlife habitat values. Avoid, minimize, and compensate for loss of seasonally flooded agricultural land habitat where evaluated species are affected by CALFED actions.

5.15 NCCP Fish Groups

The EWA ASIP also includes the anadromous and estuarine species fish groups described in the MSCS. These fish groups are discussed separately because an evaluation of NCCP habitats, which is based on vegetation, land use, and geography, does not adequately address these groups. This section identifies the species comprising each group and their associated NCCP habitats, including non-estuarine NCCP aquatic habitats that are periodically used by some estuarine fish species. Fishes included in NCCP fish groups are those that:

- Will be most affected by CALFED water storage, conveyance, and water operations actions;
- Depend on the Bay-Delta ecosystem; and
- Are subject to established USFWS, NMFS, and CDFG recovery goals.

Table 5-2. Covered Species Associated with Rice Fields[1]		
Species	**Scientific Name**	**Status[2]**
Amphibians		
Western Spadefoot	*Scaphiopus hammondii*	CSC
Reptiles		
Western Pond Turtle	*Clemmys marmorata*	CSC
Giant Garter Snake*	*Thamnophis gigas*	FT, ST
Birds		
Double-crested Cormorant	*Phalacrocorax auritus*	CSC
American Bittern*	*Botaurus lentiginosus*	FSC
Great Egret	*Casmerodius albus*	CSC
Snowy Egret	*Egretta thula*	CSC
White-faced Ibis	*Plegadis chihi*	CSC
Aleutian Canada Goose	*Branta canadensis leucopareia*	De-listed
White-tailed Kite	*Elanus leucurus*	FSC, FP
Bald Eagle	*Haliaeetus leucocephalus*	FT, PR, SE, FP
Northern Harrier*	*Circus cyaneus*	CSC
Swainson's Hawk	*Buteo swainsoni*	ST
Ferruginous Hawk	*Buteo regalis*	CSC
Golden Eagle	*Aquila chrysaetos*	PR, CSC, FP
Merlin	*Falco columbaris*	CSC
Peregrine Falcon	*Falco peregrinus*	SE, FP
Prairie Falcon	*Falco mexicanus*	CSC
Greater Sandhill Crane	*Grus canadensis tabida*	ST, FP
Mountain Plover	*Charadrius montanus*	PT, FSC, CSC
Long-billed Curlew	*Numenius americanus*	CSC
Black Tern*	*Chlidonias niger*	CSC
Burrowing Owl*	*Speotyto cunicularia*	CSC
Long-eared Owl	*Asio otus*	CSC
Short-eared Owl*	*Asio flammeus*	CSC
Bank Swallow	*Riparia riparia*	ST
Bewick's Wren	*Thryomanes bewickii*	FSC
Loggerhead Shrike	*Lanius ludovicianus*	CSC
Lark Sparrow	*Chondestes grammacus*	FSC
Tricolored Blackbird*	*Agelaius tricolor*	CSC
California Gull	*Larus californicus*	CSC

[1] *Special Status Wildlife Species Use of Rice Cultivation Lands in California's Central Valley*, Rice Management Institute, 1997 and *Affected Environment – Supplement to Vegetation and Wildlife*, Draft CALFED Technical Report, 1998.

[2] Status Codes
FE = Listed as Endangered under FESA
FT = Listed as Threatened under FESA
PT = Proposed for listing as Threatened under FESA
FSC = Federal species of management concern
PR = Protected under the Bald and Golden Eagle Protection Act
SE = Listed as Endangered under CESA
ST = Listed as Threatened under CESA
FP = Fully protected under California Fish and Game Code
CSC = California Department of Fish and Game "species of special concern"
* = Species breeds or is in some manner dependent on rice cultural habitats for successful reproduction.

5.15.1 Anadromous Fish Group

Description: The anadromous fish group includes tidal perennial aquatic, valley riverine aquatic, montane riverine aquatic, saline emergent, and tidal freshwater emergent aquatic habitats. Fish species of concern associated with these habitats include Sacramento River winter-run Chinook salmon, Central Valley fall-run/late-fall-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley and Central California Coast steelhead evolutionarily significant units (ESUs); and green sturgeon (MSCS 2000).

Historical and Current Distribution and Status: Please refer to Chapter 3, Sections 3.2.1 through 3.2.4 for a description of the historical and current distribution of the fish species being addressed as part of the anadromous fish group.

Relationship to EWA Action Area: The anadromous fish group is found in Suisun Bay, the Delta, the Sacramento and San Joaquin Rivers, and their primary tributaries the Feather, Yuba, American, and Merced Rivers.

CALFED NCCP Community Goals: The goal is to substantially improve anadromous fish species habitat and restore and maintain Chinook salmon and steelhead populations to levels that ensure the long-term viability of individual runs and species.

5.15.2 Estuarine Fish Group

Description: The estuarine fish group includes tidal perennial aquatic, valley riverine aquatic, saline emergent, and tidal freshwater emergent aquatic habitats. Fish species of concern associated with these habitats include tidewater goby, delta smelt, longfin smelt, Sacramento splittail, and Sacramento perch (MSCS 2000).

Historical and Current Distribution and Status: Please refer to Chapter 3, Section 3.2.5 and 3.2.7 for a description of the historical and current distribution of the fish species being addressed as part of the estuarine fish group.

Relationship to EWA Action Area: The estuarine fish group is found in Suisun Bay, the Delta, the Sacramento and San Joaquin Rivers, and their primary tributaries the Feather, Yuba, American, and Merced Rivers.

CALFED NCCP Community Goals: The goal is to substantially improve estuarine fish species habitat and restore and maintain populations of evaluated species of estuarine fish species to levels that ensure their long-term viability.